Getting the first grant

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Introduction

Rather sooner than later in your career as clinical or basic stroke researcher, gaining funding will become an essential part of your work. An observational study estimated that 550 working years were spent preparing 3727 proposals for the major health and medical funding schemes in Australia[1]. Considering that only a minority of grant proposals is successful, this may appear as a waste of time at first sight. However, it is time well spent, especially for younger physician scientists at an early career stage. But why is getting grants so important? Essentially because universities and research institutions often fund only part of salaries and infrastructure of a research group/division, so without additional funding from national or international research foundations most research projects would never have been conducted. Moreover, grants are important to a young researcher's career because they help to develop a reputation for excellence and over time, grants let you built up a research team of your own.

While there is no easy way or "one rule to fit all" to write a successful application, there are some steps one can take to make the process less nerve-wracking. The aim of this article is to summarize the strategies that can help to improve chances of being funded.

It is never too early to get familiar with grant writing

Even if it is not on your mind at the time, when you begin to work on a research project try to think about how it was funded, because that is what you will have to do on your own soon. As a resident or PhD student, ask to see proposals of studies which are ongoing in your division. Talk to other junior members of the research team and find out about their experiences with funding. It is good to develop a certain openness in discussing the "grant issue", the topic should not be secretive since one can learn a lot from each other. However, keep in mind you should always maintain confidentiality towards third parties when allowed to read protocols, proposals and papers of collegues. For example you might organize a "get together" with peers to discuss each others proposal and work in progress. Peer reviewing manuscripts is also a good way to learn more about how to phrase your own specific aims and hypotheses.

Probably the most important advice is to ask your mentor early on about grant opportunities. She or he will be happy to guide you while writing the first grant by reading and commenting on your drafts. Directly talk to your mentor about grant writing and ask about his experiences already when working on your first project.

Select the right funding scheme

Your goal should be to be familiar with the funding institutions supporting cerebrovascular research and to have an idea of what different funding schemes at each institution are potentially suited for your research. International (e.g. European Union) and national funding schemes, Universities and private foundations support cardiovascular research projects (Table 1) .

In general, funding is either devoted to a project or to a person (career development or training grants). As an early stage clinical researcher, a career development grant may be most

appropriate, as it allows for protected research time. In the demanding, rapidly developing field of stroke it is important to realize early that a physician-scientist needs time devoted to research, regardless of whether the research is based in the laboratory or clinic. This protected time is precious to actually do your research and develop own original ideas into concrete plans and proposals. Also, some training grants include funding for courses and degrees in order to improve your research skills.

Which funding scheme is the right one for you depends also on the use for the requested funds (own salary, salary for others, equipment, etc). Discuss the funding schemes with an experienced mentor. The Deans office of your University may provide you with a list of sources. Additionally, graduate or residency programs might provide further specific information about grant opportunities.There might be colleagues at your institution who have applied for and received funding from the exact organisation you are targeting, thus they can provide very specific insights.

Read the instructions for the application carefully: Are you really a valid candidate? Do you and/or your project fulfill the outlined criteria of this specific call ? If uncertainty remains ask questions and get in contact with the responsible person at the funding institution. Program officers are usually dedicated to helping fund the best research and they are experts in supporting applicants.

It might be helpful, before writing large, complex projects and long-term personal career grants, to consider funding opportunities for small pilot projects or travel grants in order to present research data at an international meeting. These smaller grants are a great exercise and they are also valuable evidence of the ability to win funding early on.

It takes more time than you think

Writing a good proposal may take months. Depending on the type of grant, preparation time will vary, but as a rule of thumb the very first application will likely take much longer than the second on a similar topic. Thus, a key step is to start way before you think you should start, especially if you are prone to procrastination. Also take into account that the response to the submitted application takes time, therefore you can usually not start your project until many months at the least after submitting your grant. In your planning, include plenty of time for fellow researchers and your mentor to read and comment on your proposal. Even with an experienced grant writer, the proposal improves significantly if several critical readers have gone through the grant text!

Writing your proposal

To focus of this article is not to give detailed instruction on how to write a proposal, but it might be worthwhile to mention some general points. More specific guidelines on grant writing are available elswhere[2].

First, be precise and clear about your research hypotheses and aims, these are the most critical parts of a grant. Experienced grant writers say that they spend most of the time writing a grant on writing and revising the aims. If you have good and clear aims the rest will follow.

Second, a proposal outlines and seeks support for work you hope to do, thus you need to be able to show both the novelty of your idea and the potential impact of the results of your research. In short, propose something significant and make it exciting.

Third, only a few people will read the submitted proposal so try to tailor the proposal to the needs of the very few reading it. Remember that most likely at least one of the reviewers will

not be familiar with your specific research field, thus you need to avoid jargon. In order to accomplish this you might ask friends or colleagues from other fields in medicine. They can ask questions you might not have thought of. On the other hand, for the one reviewer who is an expert in your specific research field, be precise on how you plan to achieve your research aims without losing the focus.

Forth, as a young investigator you need to show that you are familiar with the methods you use and especially mention the potential pitfalls and your back-up plan if experiments don't work as expected. People in your department can give a sense check, and may help to decide whether the plan is actually feasible in research terms.

Finally, discuss with more experienced colleagues and especially with your mentor about how realistic your time schedule and budget is. A common mistake is being over-ambitious in the expectation of what can be achieved in the timescale of an award.

The details matter

It is too bad if simple formatting or spelling errors distract from the quality of the science in the proposal. Imagine if you have to review hunderts of applications you would get also annoyed if there are many spelling errors, if you have to look up acronyms because they have not been introduced or if the figures are so small you cant see anything on them. Reviewers are usually busy and only human, they may get impatient, or they may have only very limitted time reading your application. So the grant should be written in as concise and carful way as possible.

Your standing

Usually grants for early stage researchers put more emphasis on potential--and less on actual accomplishments. Remember to consider this when writing a proposal. But also think about how

to stand out compared to others at your career stage when preparing your CV. Try to show that you have the technical skills (certificates, workshops, observerships, papers in preparation) and drive (e.g. list presented pilot research data at meetings) to carry out your research plan. Further, at some institutions mobility can be a parameter used to judge a young researcher's potential to succeed as an independent researcher. Mobility may reflect flexibility, dedication to actively seek places to learn from the best, as well as the ability to be successful in different environments. So if you have travelled and worked in different countries, this might be an advantage to get a career developmental grant, and you should state it. Point out things that are particularly interesting about your vita.

Rejection is part of the game

At the U.S. National Institutes of Health, the overall success rate for grant applications has dropped from 30% in 2003 to 19.1% in 2016.[3]. In the latest round of European Research Council Starting Grants, the rate was 11.3% [3]. Even the best grants and most experienced investigators meet rejection much of the time. Being rejected doesn't mean your idea or your person is unfundable, it is rather a natural part of the process, so be patient, try not to get discouraged. There are several reasons why an applicant or the submitted project does not get funded. Often it is not even the quality of the project or the merits of an applicant, but for example, there might be just lack of sufficient funding to support all good projects or other issues outside of the investigator's control. So keep on trying.

Response to reviewers

At some funding institutions such as the "National Institute of Neurological Disorders and Stroke" resubmission is allowed with response to comments. This is a great opportunity to actually improve the project, and you should take advantage of it. Be sure to answer questions directly and try to be as responsive to each comment as possible. Even if you disagree with a

reviewer explain why you disagree , the same way you would do this in a decent conversation. Understand that writing comments is the only way a reviewer can communicate with you. Some reviewers may have excellent ideas to improve your work, some may communicate them in a perfect way while others may have difficulties to do so, however they usually are not meant to offend you, the vast majority of reviewers are highly supportive especially of early career applicants.

Addressing suggestions from reviewers when rejected at one institution may improve your chances to get funded at another institution because the grant is most probably better after addressing the raised issues But even if you decide to leave one idea behind pursuing another hypothesis, the work that has gone into writing a proposal is never lost; see it as a learning point. Most stroke researchers will agree that new ideas and collaborations can arise from grant writing. With all the effort don't forget: it feels great to get your first grant!

Helpful resources

There are books and webpages with videos, workshops and other means available which can help in getting the first grant. Among many, here are two links to helpful videos:

National Institutes of Health (NIH) Tips for applicants video:

https://www.youtube.com/watch?v=lAOGtr0pM6Q

European Research Council (ERC) step by step:

https://www.youtube.com/watch?v=pTSqQo-_Z94

Disclosures:

None relevant for this manuscript.

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2. https://professional.heart.org/idc/groups/ahamah-public/@wcm/@sop/@rsch/documents/downloadable/ucm_426709.pdf

3. http://www.sciencemag.org/news/2017/04/new-system-scientists-never-have-write-grant-application-again

Table 1

Potential funding institutions in the US and Europe

(non comprehensive list)

Regional/local Institutions **governmental or private**	**National Institutions** **governmental or private**	**International Institutions** **governmental or private**
Universities often provide career development awards	National Science Foundations exist in most countries	European Research Counsel
Regional private foundations affiliated with universities	National Institution of Neurological Diseases and Stroke (NINDS) in the U.S.	Fondation Leducq (transatlantic)
Individuals (Philantropist) sometimes provide grants	Most Countries have a Heart and or Stoke Association/Foundation with several funding mechanisms	Some of the large pharmaceutical companies provide grants
	Private Foundations such as: The Hazel K. Goddess Fund for Stroke Research in Women in the U.S. Stroke Shield Foundation in the U.S.	